

CLAIMS

1. A carrier holding micro-substances comprising:
a carrier holding one or more remote-acting bodies capable of being manipulated for
positions thereof by a remote force, and one or more micro-substances containing a
5 target substance of assay and so on, in the surfaces of the carrier, wherein positions
of micro-substances are controlled by a remote manipulation of the remote-acting
bodies which are held together with micro-substances in the surfaces of the carrier.
2. A carrier holding micro-substances according claim 1, wherein the carrier
holds the remote-acting bodies and micro-substances by fixing to a plurality of holes,
10 cavities, concavities or convexities, adsorption or adhesion in the surfaces per se,
reaction by a prescribed reaction substances coated thereon, or combination
therewith.
3. A carrier holding micro-substances according to claim 1 or claim 2,
wherein the carrier is formed by organic substances such as high molecular
15 compound, inorganic substance such as ceramics or metals, or living bodies.
4. A carrier holding micro-substances according to claims 1 to 3, wherein the
carrier is made of tissue substance such as cellulose.
5. A carrier holding micro-substances according to claims 1 to 4, wherein
micro-substances include one or more kinds of intervene substances through which
20 said target substances or the remote-acting bodies are held in the carrier.
6. A carrier holding micro-substance according to claims 1 to 5, wherein the
micro-substances include auxiliary substances such as marker substances and so
on.
7. A carrier holding micro-substances according to Claims 1 to 6, wherein
25 the remote-acting bodies are made of magnetic substances.
8. A carrier holding micro-substances according to claims 1 to 6, wherein the
remote-acting bodies are made of charged bodies or substances having a different
dielectricity from that of the suspended system.

9. A carrier holding micro-substances according to claims 1 to 6, wherein the remote-acting bodies are micro-organisms having such taxis as lumino-taxis or magno-taxis.

10. A carrier holding micro-substances according to ~~claims 1 to 6~~, wherein
5 the remote-acting bodies are expandable particles whose volume changes in accordance with temperature or pressure.

11. A carrier holding micro-substances according to ~~claims 1 to 6~~, wherein the remote-acting bodies are made of transparent substances or semi-transparent substances.

10 12. A carrier holding micro-substances according to claim 1, wherein the remote-acting bodies are magnetic particles and the carrier is made of cellulose.

13. A system suspending carriers holding micro-substances is a suspension of remote-acting bodies, micro-substances and carriers which are described in claims 1 to 12 in a liquid, a gas or a solid.

15 14. A system suspending carriers holding micro-substances according to claim 13,
wherein the carrier is a sterilized cellulose-carrier having a plurality of cavities or holes, the remote-acting bodies are sterilized magnetic particles, micro-substances contain micro-organisms being target of an assay and a sterilized reductive enzyme
20 used as a marker substance, and the liquid is a sterilized liquid culture medium.

15. A system suspending carriers holding micro-substances according to claim 13,
wherein the carrier is a cellulose-carrier having a plurality of cavities or holes, the remote-acting bodies are magnetic particles, and micro-substances are antibiotin or
25 anticancer substances.

16. A system suspending carriers holding micro-substances according to claim 13,
wherein the suspended remote-acting bodies and the carriers are used as auxiliary

chemicals for filtering so that micro-substances being hard to filter can be filtrated.

17. An apparatus for manipulating carriers holding micro-substances comprises a container accommodating the suspension system or a liquid passage passing the suspension according to claims 13 to 16, and remote-manipulating means mounted out of the container or the liquid passage to manipulate the remote-acting bodies in the container or the liquid passage remotely.

18. An apparatus for manipulating carriers holding micro-substances according to claim 17,

wherein the remote-manipulating means is a magnetic source such as a permanent magnet or a solenoid generating a magnetic field to be applied to the remote-acting bodies made of magnetic substances.

19. An apparatus for manipulating carriers holding micro-substances according to claim 17,

wherein the remote-manipulating means is one or more electrodes which alternative current or direct current voltage is supplied when the remote-acting bodies are made of charge bodies or dielectric bodies, and is a controllable heat source or a pressure control means when the remote-acting bodies are expandable particles whose volume changes in accordance with temperature or pressure.

20. An apparatus for manipulating carriers holding micro-substances according to claim 17,

wherein the remote-manipulating means is an optical source such as a laser ray or an infra-red ray and so on when the remote-acting bodies are micro-organisms having lumino-taxis, or transparent or opaque substances.

21. An apparatus for manipulating carriers holding micro-substances according to claim 17,

wherein plural kinds of remote-manipulating means are mounted.

22. A method of controlling a position of carrier holding micro-substances comprises the steps of:

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pouring remote-acting bodies for positions thereof to be manipulated by a remote force, micro-substances including target substances of an assay and so on, carriers capable of holding micro-substances and the remote-acting bodies, into a liquid, a gas or a solid in accordance with a predetermined order,

5 agitating the suspension to hold the micro-substances and the remote-acting bodies in the carriers,

controlling positions of the carriers holding the micro-substances and the remote-acting bodies in the surfaces thereof by applying a remote force to the remote-acting bodies.

10 23. A method of controlling positions of carriers holding micro-substances according to claim 22, wherein the remote-acting bodies, micro-substances and carriers are described in claims 2 to 12.

15 24. A method of controlling positions of carriers holding micro-substances according to claim 22, comprises the steps of:

pouring sterilized reductive enzyme, micro-organisms such as bacteria or viruses being a target substance of an assay and so on, and sterilized cellulose-carriers in a sterilized liquid culture medium,

pouring magnetic particles in the liquid culture medium,

20 agitating the liquid suspended by them,

controlling positions of the micro-organisms by applying or removing a magnetic field.

25 25. A method of controlling positions of carrier holding micro-substances according to claim 22, comprises the steps of:

pouring cellulose-carriers having a plurality of cavities or holes, magnetic particles, and micro-substances such as antibiotics or anticancer substances,

agitating the liquid suspended by them,

controlling positions of the carriers holding micro-substances and the remote-

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acting bodies in the surfaces thereof by applying or removing a magnetic field to or

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from the remote-acting bodies.

26. A method of controlling positions of carriers holding micro-substances according to claim 22, comprises the steps of:

pouring micro-substances being hard to be filtered, remote-acting bodies, and
5 carriers into a liquid,

agitating the liquid suspended by them,

controlling so as to use the remote-acting bodies and carriers as auxiliary chemicals for filtration by applying or removing a magnetic field to the liquid